

(19)日本国特許庁 (J P)

(12) 特 許 公 報 (B 2)

(11)特許番号

特許第3029655号
(P3029655)

(45)発行日 平成12年4月4日(2000.4.4)

(24)登録日 平成12年2月4日(2000.2.4)

(51)Int.Cl.⁷

識別記号

F I

B 6 0 R 21/20

B 6 0 R 21/20

請求項の数2(全 6 頁)

(21)出願番号 特願平2-248018

(22)出願日 平成2年9月18日(1990.9.18)

(65)公開番号 特開平4-151345

(43)公開日 平成4年5月25日(1992.5.25)

審査請求日 平成9年6月12日(1997.6.12)

(73)特許権者 999999999

株式会社イノアックコーポレーション
愛知県名古屋市名東区名駅南2丁目13番
4号

(73)特許権者 999999999

トヨタ自動車株式会社
愛知県豊田市トヨタ町1番地

(72)発明者 渡辺 幸任

愛知県安城市今池町3丁目1番36号 株
式会社イノアックコーポレーション安城
事業所内

(74)代理人 999999999

弁理士 後藤 憲秋 (外1名)

審査官 藤井 昇

最終頁に続く

(54)【発明の名称】 自動車用エアバックドア表皮の製造方法

1

(57)【特許請求の範囲】

【請求項1】熱可塑性プラスチックからなる所定形状のシート状表皮材に分割用のV字形溝を形成して自動車用エアバックドア表皮を製造する際に、分割線を定める加熱刃により、該シート状表皮材裏面の分割予定部を当該シート状表皮材成形後の後加工で押圧して、該シート状表皮材裏面に分割用のV字形溝を形成するとともに、該V字形溝の両側縁に沿って厚肉部を形成することを特徴とする自動車用エアバックドア表皮の製造方法。

【請求項2】分割線を定める加熱刃によるシート状表皮材裏面の押圧に際して、該シート状表皮材を支持台表面に真空吸引しながら、該支持台上のシート状表皮材裏面の分割予定部を加熱刃で押圧することを特徴とする、請求項1に記載の自動車用エアバックドア表皮の製造方法。

2

【発明の詳細な説明】

(産業上の利用分野)

この発明は自動車用エアバックドア表皮の製造方法に関する。

(従来技術)

自動車用エアバッグは、自動車衝突時にガスによって瞬間的に膨張して乗員とフロントガラス間で展開するものである。そのエアバッグは、通常運転席側においてはハンドルの中央パネル裏面に、また助手席側においては正面のインストルメントパネル裏面に折り畳まれた状態で収納される。

その自動車用エアバッグの収納部には、蓋としてのエアバックドアが取り付けられる。エアバックドアは、平常時にあっては折り畳まれたエアバッグを隠蔽して車内の美感を維持する一方、衝突の際には膨張したエアバッ

BEST AVAILABLE COPY

グにより押されて外方へ開き、エアバッグの展開を可能にするものである。

また、そのエアバッグドアは、車種によっては他の内装部品と同様に、ソフトな表面触感が求められる。

従来、そのようなエアバッグドアとして、第12図に示すように芯材12aと、ポリウレタンフォーム等の合成樹脂発泡体12bとエアバッグドア表皮12cの三層構造からなるエアバッグドアが用いられている。

ところが、前記従来品は可視面になるエアバッグドア表皮12cの表面に、破断用薄肉部としての分割用V字形溝13が分割線として存在するため、その分割線によって自動車内装のデザインに制約を与える問題がある。

また、そのエアバッグドア表皮12cの製造は、従来、真空成形あるいはパウダースラッシュ成形により表皮形状に成形した熱可塑性プラスチック製シートからなる表皮材の表面所定位置に、ナイフ等で分割用V字形溝を彫ることによりなされる。そのため、ナイフの切れ味や、作業者の熟練度等によってV字形溝の深さが異なったり、V字形溝が蛇行する等の不具合を生じやすく、一定品質のエアバッグドア表皮を得難い問題があった。

(発明が解決しようとする課題)

この発明は、前記の点に鑑みてなされたものであって、可視面となる表面に分割用V字形溝からなる分割線が現れることのないV字形溝を簡単かつ精度よく形成することができ、しかも、エアバッグ膨張時には、エアバッグ膨張圧力でV字形溝を確実に破断させることのできる自動車用エアバッグドア表皮の製造方法を提供しようとするものである。

(課題を解決するための手段)

ここで提案する発明には、自動車用エアバッグドア表皮の製造方法に関する第1および第2の発明がある。

第1の発明は、熱可塑性プラスチックからなる所定形状のシート状表皮材に分割用のV字形溝を形成して自動車用エアバッグドア表皮を製造する際に、分割線を定める加熱刃により、該シート状表皮材裏面の分割予定部を押圧して、該シート状表皮材裏面の分割予定部を当該シート状表皮材成形後の後加工で押圧して、該シート状表皮材裏面に分割用のV字形溝を形成するとともに該V字形溝の両側縁に沿って厚肉部を形成することを特徴とする。

さらに第2の発明は、第1の発明において、より一定の分割用V字形溝を形成するため、前記シート状表皮材を支持台表面に真空吸引しながら該支持台上のシート状表皮材裏面の分割予定部を加熱刃で押圧して、該シート状表皮材裏面に分割用のV字形溝を形成することにしたのである。

(作用)

第1の発明の製造方法においては、熱可塑性プラスチックからなる所定形状のシート状表皮材は、熱により変形する性質を有する。そのため、そのシート状表皮材裏

面の分割予定部を加熱刃で押圧することにより、シート状表皮材裏面の押圧部が断面V字形に変形し、分割用のV字形溝が形成される。

また、前記シート状表皮材には、通常厚みが1~2mm程度で柔軟性のあるものが用いられるため、前記加熱刃によるシート状表皮材裏面の押圧に際して、その表皮材を支持台表面に載置してその押圧をしようとしても、表皮材が支持台表面から部分的に浮いたり、ねじれたりしやすく、分割用V字形溝が正しく形成されない虞がある。特に、そのシート状表皮材がパウダースラッシュ成形からなる場合には、真空成形による場合よりも表皮材の厚みが薄くなるため、前記虞は大になる。

ところが、第2の発明によれば、加熱刃によるシート状表皮材裏面の押圧を、シート状表皮材を支持台表面に真空吸引しながら行うため、そのシート状表皮材が支持台表面に密着固定され、加熱刃とそのシート状表皮材表面との間隔が一定になる。そのため、加熱刃の押圧により形成されるV字形溝は、常に深さ・形状が一定のものになる。

(実施例)

はじめに第1の発明の製造方法によって得られたエアバッグドア表皮の実施例について説明する。第1図は第1発明の実施により得られたエアバッグドア表皮の一例を示す断面図である。図示のエアバッグドア表皮50は、あらかじめ真空成形あるいはパウダースラッシュ成形等により所定の表皮形状に形成されたシート状表皮材において、乗員の目に触れない裏面に、この表皮50をエアバッグドアに形成した際の分割予定部に沿って分割用のV字形溝36が設けられたものである。したがって、エアバッグドア表皮50の可視面にはV字形溝36が現れないため、表皮50の外観が損なわれず良好なものとなる。

また、前記V字形溝36の両側縁には、V字形溝36に沿って厚肉部38が形成されている。この厚肉部38は、V字形溝36の両側縁に強度の高い部分を設けることによって、V字形溝36の両側縁の強度を高くするとともに、そのV字形溝36の両側縁に比べてV字形溝36内の強度を極端に弱くするものである。それにより、エアバッグの膨張による圧力がエアバッグドア表皮50に加わった際に、前記圧力がV字形溝36内に集中してV字形溝36を速やかに破断させ、エアバッグドアの開口を確実かつ速やかに行われるようにする。

なお、前記V字形溝36の溝形状は、図のような溝底部が鋭角に尖った形状に限定されることはなく、エアバッグドアの形状や表皮の材質等により、鈍角形状または溝底面を曲面状としてもよい。

次に第1発明のエアバッグドア表皮の製造方法の実施例について説明する。第2図は第1発明の製造方法の一例を示す装置の側面図、第3図はそのA-A断面図、第4図は加熱刃によるシート状表皮材裏面押圧時の部分拡大断面図である。

まず、第2図および第3図に示すように、真空成形あるいはパウダースラッシュ成形等により所定形状に成形した塩化ビニル樹脂等からなる熱可塑性プラスチック製のシート状表皮材20を、裏面が上になるようにして支持台22表面に載置する。

支持台22は、シート状表皮材20より大なる大きさからなるもので、そのシート状表皮材20が載置される表面に、後記する加熱刃24の押圧量（シート状表皮材20内への加熱刃24の進入量）を規制する突起26が表皮材20の外側位置に設けられている。

次に、加熱刃24をヒーター本体28とともに下降させて、シート状表皮材20裏面の分割予定部を加熱刃24で押圧する。

前記加熱刃24は先端の刃の部分が断面V字形からなり、支持台22上方に位置するヒーター本体28下面に、取り付けネジ30によって下向きに取り付けられて、ヒーター本体28により所定温度に加熱される。加熱刃24の加熱温度は、シート状表皮材20の材質あるいは加熱刃24の押圧時間等により異なるが、通常、シート状表皮材20を構成する熱可塑性プラスチックの溶融温度にほぼ等しい温度とされる。たとえば、シート状表皮材20が、パウダースラッシュ成形により形成された厚み1.0～1.2mmの塩化ビニル樹脂製のもので、加熱刃の押圧時間が5～15秒の場合には、約180～250℃が適当である。また加熱刃24によるシート状表皮材20の押圧量は、その押圧時における加熱刃24とシート状表皮材20表面（支持台22表面）間の距離が0.4～0.9mmとなるようにするのが好ましい。なお、その押圧量の調節は、後記するヒーター本体28下面の棒状突起32と前記支持台22表面の突起26の高さを所定値に選定することによりなされる。また、前記したように、V字形溝の底面を曲面状とする時には、前記加熱刃24の先端部分を丸めておけばよい。

一方、ヒーター本体28は、該ヒーター本体28に取り付けられている加熱刃24を所定温度に加熱するとともに、その加熱刃24を上下動させて、加熱刃24によるシート状表皮材20裏面の押圧を可能にするものである。そのヒーター本体28には、加熱刃24を加熱するためのニクロム線等の電熱線が配線されるとともに、加熱刃24によるシート状表皮材20裏面の押圧量を一定にするため、ヒーター本体28下降時に前記支持台22表面の突起26と当たってヒーター本体28を所定位置で止める棒状突起32が下面に設けられている。なお、ヒーター本体28の上下動は、エアシリンダー等の上下動手段34によりなされる。

加熱刃24により押圧されたシート状表皮材20裏面の分割予定部は、第4図のような加熱刃24の形状に変形し、分割用のV字形溝36が形成される。その際V字形溝36の両側縁には、加熱刃24によって溶融したプラスチックが、当該加熱刃24により溝側縁に押し上げられて盛り上がり、土手状となった厚肉部38がV字形溝36に沿って形成される。

そして、この加熱刃24による押圧を所定時間、通常5～15秒行った後、ヒーター本体28とともに加熱刃24を上昇させて加熱刃24による押圧を解除し、成形品を支持台22から外せば、第1図に示した所望のエアバッグドア表皮50が得られる。

次に第2発明の製造方法の実施例について説明する。第5図はその実施例におけるエアバッグドア表皮の製造の際に使用する装置の側面図、第6図はそのB-B線断面図、第7図はシート状表皮材を支持台表面に載置し吸引する際の断面図、第8図は加熱刃によるシート状表皮材裏面の押圧時を示す部分拡大断面図である。なお、図中の符号について、第2図ないし第4図と同一の符号は同じ部材を示す。

まず、装置の支持台40および加熱刃24等について説明する。支持台40は、第6図に示すように、内部が中空からなるもので、その中空部42と平坦な上側表面とを連通する複数の真空吸引孔46と、中空部42と外部の真空ポンプ（図示せず）とを連結する筒状の吸引口48とを表面あるいは側部に有している。この支持台40の表面には、加熱刃24の押圧量を規制する突起26が形成されている。

なお、加熱刃24、前記加熱刃24をヒーター本体28に取り付けるネジ30、前記加熱刃24を所定温度に加熱するヒーター本体28、加熱刃24によるシート状表皮材20裏面の押圧量を規制する棒状突起32については第1発明の実施例と同様である。

そして、第7図のように、あらかじめパウダースラッシュ成形等により所定形状に成形したシート状表皮材20を、その裏面が上向きになるようにし、かつ分割予定部が加熱刃24の真下になるようにして支持台40表面に載置し、支持台40表面の真空吸引孔46を介してそのシート状表皮材20を支持台40表面に真空吸引する。これによって、所定形状のシート状表皮材20が、支持台40表面に吸着、保持されるとともに、支持台40の表面形状に従って平面状にされる。

続いて、上下動手段34の作動により、棒状突起32が支持台40表面の突起26に当たるまで前記ヒーター本体28を下降させる。これによって、シート状表皮材20裏面の分割予定部が、第8図のようにヒーター本体28下面の加熱刃24により所定量押圧され、表皮材20裏面の分割予定部に断面V字形溝36が形成される。その際、シート状表皮材20が支持台40表面に真空吸引されているため、シート状表皮材20の表面と支持台40の表面は隙間なく密着し、該シート状表皮材20の表面と加熱刃24間の距離aが常に一定となり、一定深さの分割用V字形溝36が形成される。なお、符号38は加熱刃24の押圧によりシート状表皮材20裏面のV字形溝36両側縁に形成された厚肉部である。

その後、上下動手段34の作動により、ヒーター本体28を上昇させて加熱刃24によるシート状表皮材裏面の押圧を解除するとともに、シート状表皮材20の真空吸引も解

除して、成形品を支持台40表面から外せば、第1図に示したような所望のエアバッグドア表皮50を得る。なお、支持台40表面に真空吸引されていたシート状表皮材は、真空吸引の解除によって真空吸引前の形状に復帰する。

第9図は前記エアバッグドア表皮50を用いてエアバッグ装置の一例の断面図、第10図はその部分拡大断面図、第11図はそのエアバッグ装置が取り付けられたインストルメントパネルの一例を示す斜視図である。図示のように、エアバッグドア52は、芯材54、ウレタンフォーム等の合成樹脂発泡体56、および前記エアバッグドア表皮50の三層から構成されている。芯材54は両開きの扉形状をした二つの硬質プラスチック製品から構成され、その外側端部が助手席側のインストルメントパネル58に取り付けられる。

エアバッグ装置60は、エアバッグ62、エアバッグ収納部64、インフレーター66、および前記三層構造のエアバッグドア52から構成されている。そのエアバッグ装置60は、自動車衝突時にインフレーター66の作動によりエアバッグ62が膨張して内側からエアバッグドア52を押し、その押圧力によってエアバッグドア表皮50裏面の分割用V字形溝36が破断して該エアバッグドア52が外側へ開き、それによってエアバッグ62が乗員とフロントガラスの間で展開し乗員を保護する。また、その際、エアバッグドア表皮50は、分割用V字形溝36の両側にある盛り上がった厚肉部38によりその分割用V字形溝36の両側の強度が高くなっているため、エアバッグの膨張による押圧力が分割用V字形溝36に集中しやすく、そのV字形溝36を従来のナイフ等で形成した場合に比べ、短時間で確実に破断させることができる。しかも、前記V字形溝36は常時には乗員の目に触れることのないエアバッグドア表皮50の裏面側に形成されているため、インストルメントパネルのデザイン上の妨げや制限となることもない。

(効果)

第1発明の自動車用エアバッグドア表皮の製造方法によれば、シート状表皮材成形後の後加工において、加熱刃によりシート状表皮材の裏面を押圧して分割用V字形溝を形成するとともにそのV字形溝の両側縁に沿って厚肉部を形成するため、そのV字形溝が蛇行等することがなく、不良品の発生を少なくすることができる。しかも、第1発明の実施により得られるエアバッグドア表皮

は、分割用V字形溝が乗員の目にふれないエアバッグドア表皮の裏側に形成されるため、車室内のデザインが制限されることもない。それに加えて、V字形溝の両側縁に厚肉部が形成されてV字形溝の両側縁の強度が高められているため、V字形溝内の強度がその周囲と比較して極端に低下した状態となり、エアバッグ膨張時の押圧力がV字形溝内に集中しやすくなっている。したがって、前記V字形溝内で確実に破断し、エアバッグドアの速やかかつ確実な開放を可能とする。

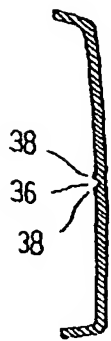
さらに、第2発明の自動車用エアバッグドア表皮の製造方法によれば、前記第1発明の効果に加えて、シート状表皮材を支持台表面に真空吸引しながら、前記加熱刃によるシート状表皮材裏面の押圧を行うため、その押圧時に加熱刃とシート状表皮材表面間の距離を一定にして、その押圧によって形成されるV字形溝を常に一定の形状とすることができ、設計通りの圧力がV字形溝を破断させることができる。加えて、シート状表皮材を真空吸引することにより、加熱刃の押圧時に表皮材を支持台表面に正しく保持することができ、V字形溝の位置を正確なものとすることができる。

【図面の簡単な説明】

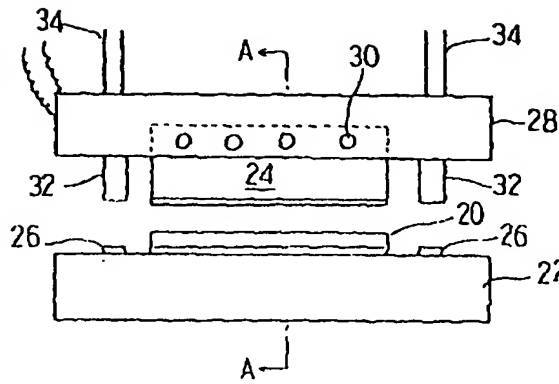
第1図は第1発明の実施により得られたエアバッグドア表皮の一例の断面図、第2図は第1発明の製造方法の一例を示す装置の側面図、第3図はそのA-A断面図、第4図は同実施例において加熱刃によるシート状表皮材裏面押圧時を示す部分拡大断面図、第5図は第2発明の実施例における装置の側面図、第6図はそのB-B線断面図、第7図は同実施例においてシート状表皮材を支持台表面に載置し吸引する際を示す断面図、第8図は同実施例において加熱刃によるシート状表皮材裏面の押圧時を示す部分拡大断面図、第9図はこの発明の製造方法によって製造されたエアバッグドア表皮50を用いたエアバッグ装置の一例を示す断面図、第10図はその部分拡大断面図、第11図はそのエアバッグ装置が取り付けられたインストルメントパネルの一例を示す斜視図、第12図は従来の方法により製造されたエアバッグドア表皮を用いるエアバッグドアの断面図である。

20……シート状表皮材、24……加熱刃、36……V字形溝、38……厚肉部、40……支持台、44……支持台表面、46……真空吸引孔

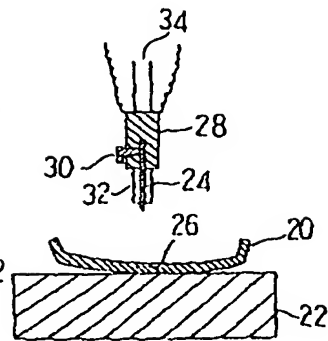
【第1図】



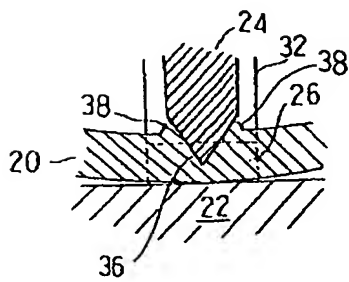
【第2図】



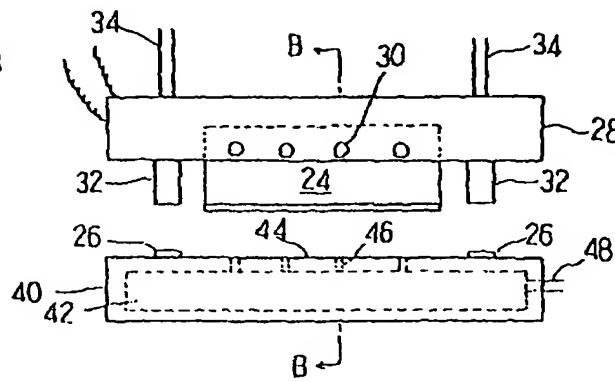
【第3図】



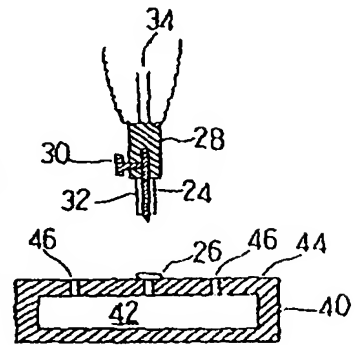
【第4図】



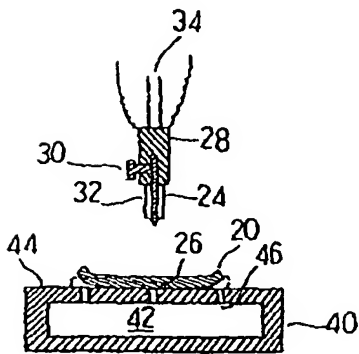
【第5図】



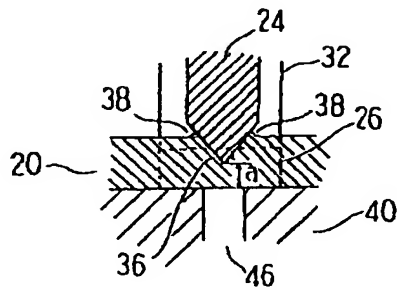
【第6図】



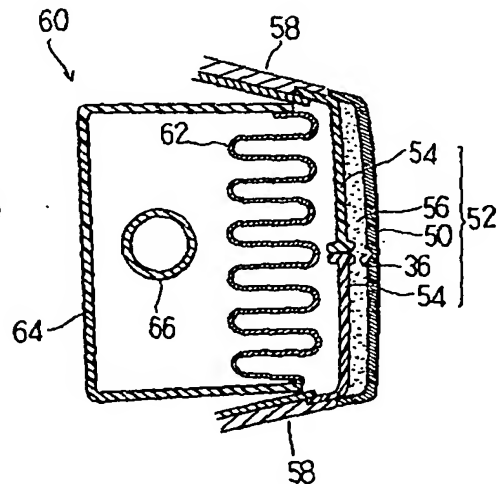
【第7図】



【第8図】

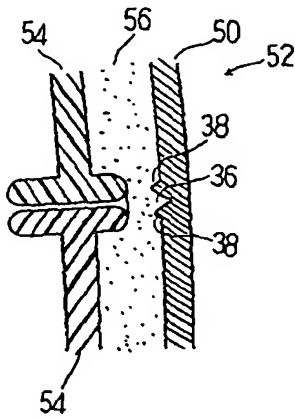


【第9図】

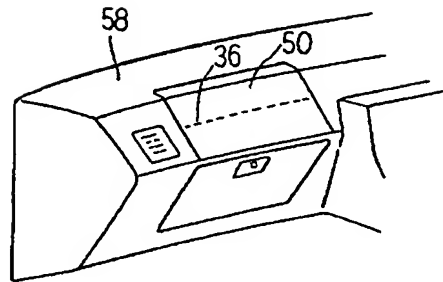


BEST AVAILABLE COPY

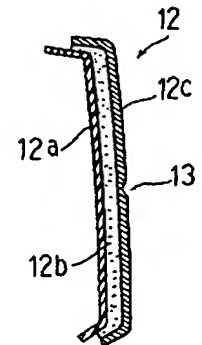
【第 1 0 図】



【第 1 1 図】



【第 1 2 図】



フロントページの続き

(72) 発明者 鈴木 英郎
愛知県安城市今池町 3 丁目 1 番 36 号 株
式会社イノアックコーポレーション安城
事業所内

(56) 参考文献 特開 平 2 - 99324 (J P , A)
特開 昭 58 - 38131 (J P , A)
特開 平 2 - 192928 (J P , A)
特開 平 2 - 63811 (J P , A)
実開 平 1 - 83652 (J P , U)

(58) 調査した分野 (Int. Cl. ⁷ , D B 名)
B60R 21/16 - 21/32

BEST AVAILABLE COPY

PATENT ABSTRACTS OF JAPAN

(11)Publication number : 04-151345

(43)Date of publication of application : 25.05.1992

(51)Int.Cl.

B60R 21/20

(21)Application number : 02-248018

(71)Applicant : INOAC CORP
TOYOTA MOTOR CORP

(22)Date of filing : 18.09.1990

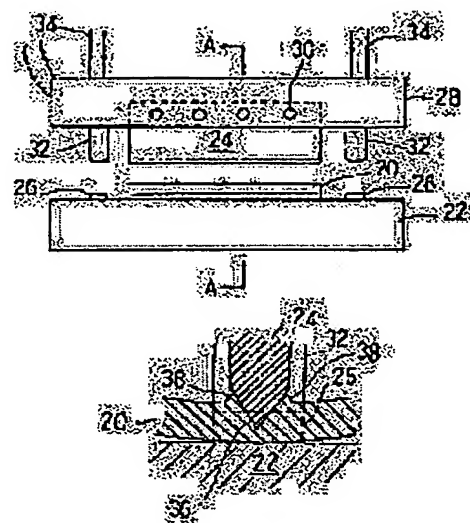
(72)Inventor : WATANABE YUKITAKA
SUZUKI HIDEO

(54) MANUFACTURE OF AUTOMOTIVE AIR BAG DOOR SKIN

(57)Abstract:

PURPOSE: To prevent a divisional line from appearing on the surface of an air bag door skin in manufacturing the skin via the formation of a divisional V-groove on a thermoplastic sheet material by pressing the predetermined divisional line portion on the reverse side of the skin material with a heated cutter for determining the line.

CONSTITUTION: In the manufacturing an air bag door skin, a thermoplastic sheet skin material 20 comprising vinyl chloride resin or the like formed to the predetermined shape through a vacuum forming process, a powder slashing process or the like, is so placed on the surface of a support seat 22 as to keep the reverse side thereof up. Then, a heated cutter 24 is lowered together with a heater body 28 and presses the predetermined portion of a divisional line on the reverse side of the sheet skin material 20. As a result, the predetermined divisional line portion on the reverse side of the skin material 20 is deformed to have the shape of the heated cutter 24 in section, thereby forming a divisional V-groove 36. In this case, plastic material 20 swells at both sides of the groove 36, due to the pressure of the heated cutter 24, and a bank portion 38 is formed. No divisional line, however, appears on the upper surface of the skin material 20.



LEGAL STATUS

[Date of request for examination]

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the
examiner's decision of rejection or application
converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision of
rejection][Date of requesting appeal against examiner's decision
of rejection]

[Date of extinction of right]

* NOTICES *

JPO and NCIPJ are not responsible for any damages caused by the use of this translation.

- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.*** shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

CLAIMS

(57) [Claim(s)]

[Claim 1] In case V typeface slot for division is formed in the sheet-like epidermis material of the predetermined configuration which consists of thermoplastics and the air bag door epidermis for automobiles is manufactured, with the heating cutting edge which defines a parting line The manufacture approach of the air bag door epidermis for automobiles characterized by forming a heavy-gage part along with the edges on both sides of these V typeface slots while pressing the division schedule section on this rear face of sheet-like epidermis material by post processing after the sheet-like epidermis material shaping concerned and forming V typeface slot for division in this sheet-like epidermis material rear face.

[Claim 2] The manufacture approach of the air bag door epidermis for automobiles according to claim 1 characterized by pressing the division schedule section on the rear face of sheet-like epidermis material on this susceptor with a heating cutting edge while carrying out vacuum suction of this sheet-like epidermis material on a susceptor front face on the occasion of the press on the rear face of sheet-like epidermis material with the heating cutting edge which defines a parting line.

[Translation done.]

*** NOTICES ***

JP0 and NCIP1 are not responsible for any damages caused by the use of this translation.

- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.**** shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

DETAILED DESCRIPTION

[Detailed Description of the Invention]**(Field of the Invention)**

This invention relates to the manufacture approach of the air bag door epidermis for automobiles.

(Conventional technique)

At the time of an automobile collision, by gas, the air bag for automobiles expands momentarily and is developed between crew and a windshield. The air bag is contained after usually having been folded up by the control-house-panel rear face of a handle at the front instrument-panel rear face in a passenger side again in a drivers side.

The air bag door as a lid is attached in the stowage of the air bag for automobiles. While an air bag door conceals the air bag folded up if it was at the time of usual and maintains a feeling of beauty in the car, it is pushed by the air bag which expanded in the case of a collision, is opened to the method of outside, and enables expansion of an air bag.

Moreover, depending on a type of a car, as for the air bag door, a soft surface feel is searched for like other interior parts.

Conventionally, the air bag door which consists of 3 layer structures of core material 12a, synthetic-resin foam 12b, such as BORIURE tongue form, and air bag door epidermis 12c as shown in Fig. 12 is used as such an air bag door.

However, since V typeface slot 13 for division as a thin-walled part for fracture exists in the front face of air bag door epidermis 12c which turns into a visible side as a parting line, the problem which gives constraint to the design of automobile interior by the parting line is conventionally [said] refined.

Moreover, manufacture of the air bag door epidermis 12c is made by engraving with V typeface slot for division conventionally the surface predetermined location of epidermis material which consists of a thermoplastic sheet fabricated in the epidermis configuration by the vacuum forming or powder slush molding with a knife etc.

Therefore, V typeface depth of flute changed with the sharpness of a knife, an operator's levels of skill, etc., or it was easy to produce the fault of V typeface slot lying in a zigzag line, and there was a problem difficult to get about the air bag door epidermis of fixed quality.

(Object of the Invention)

This invention can form V typeface slot where the parting line which consist of a V typeface slot for division do not appear in the front face which be make in view of the aforementioned point and turn into a visible side with a simply and sufficient precision , and , moreover , tend to offer the manufacture approach of the air bag door epidermis for automobiles that V typeface slot can be make to fracture certainly by air bag expansion thrust , at the time of air bag expansion .

(The means for solving a technical problem)

There is the 1st and 2nd invention about the manufacture approach of the air bag door epidermis for automobiles among the invention proposed here.

In case the 1st invention forms V typeface slot for division in the sheet-like epidermis material of the predetermined configuration which consists of thermoplastics and manufactures the air bag door epidermis for automobiles, with the heating cutting edge which defines a parting line While pressing the division schedule section on this rear face of sheet-like epidermis material, pressing the division schedule section on this rear face of sheet-like epidermis material by post processing after the sheet-like epidermis material shaping concerned and forming V typeface slot for division in this sheet-like epidermis material rear face, it is characterized by forming a heavy-gage part along with the edges on both sides of these V typeface slots. Furthermore, in the 1st invention, 2nd invention was carried out to pressing the division schedule section on the rear face of sheet-like epidermis material on this susceptor with a heating cutting edge, carrying out vacuum suction of said sheet-like epidermis material on a susceptor front face, and forming V typeface slot for division

in this sheet-like epidermis material rear face in order to form more fixed V typeface slot for division.

(Operation)

In the manufacture approach of the 1st invention, the sheet-like epidermis material of the predetermined configuration which consists of thermoplastics has the property which deforms with heat. Therefore, by pressing the division schedule section on the rear face of sheet-like epidermis material with a heating cutting edge, the press section on the rear face of sheet-like epidermis material deforms into a cross-section V typeface, and V typeface slot for division is formed.

Moreover, since that in which thickness usually has flexibility by about 1-2mm is used, even if it is going to lay the epidermis material in a susceptor front face and is going to carry out the press on the occasion of the press on the rear face of sheet-like epidermis material with said heating cutting edge, epidermis material floats partially from a susceptor front face, or it can be easy to twist to said sheet-like epidermis material, and there is a possibility that V typeface slot for division may not be formed correctly in it. Since the thickness of epidermis material becomes thin rather than the case where it is based on a vacuum forming when the sheet-like epidermis material consists of powder slush molding especially, said fear becomes size.

However, in order to perform the press on the rear face of sheet-like epidermis material with a heating cutting edge according to the 2nd invention, carrying out vacuum suction of the sheet-like epidermis material on a susceptor front face, adhesion immobilization of the sheet-like epidermis material is carried out on a susceptor front face, and spacing of a heating cutting edge and its sheet-like epidermis material front face becomes fixed. Therefore, V typeface slot formed of press of a heating cutting edge always becomes what has fixed depth and configuration.

(Example)

The example of the air bag door epidermis first obtained by the manufacture approach of the 1st invention is explained. Fig. 1 is a sectional view showing an example of the air bag door epidermis obtained by implementation of the 1st invention. Along with the division schedule section at the time of the air bag door epidermis 50 of illustration forming this epidermis 50 in the rear face which cannot touch crew's eyes at an air bag door in the sheet-like epidermis material beforehand formed in the predetermined epidermis configuration of a vacuum forming or powder slush molding, V typeface slot 36 for division is formed. Therefore, since V typeface slot 36 does not appear in the visible side of the air bag door epidermis 50, the appearance of epidermis 50 is not spoiled but it will become good.

Moreover, the heavy-gage part 38 is formed in the edges on both sides of said V typeface slot 36 along V typeface slot 36. This heavy-gage part 38 weakens reinforcement in V typeface slot 36 extremely compared with the edges on both sides of that V typeface slot 36 while making high reinforcement of the edges on both sides of V typeface slot 36 by preparing a part with high reinforcement in the edges on both sides of V typeface slot 36. Thereby, when the thrust by expansion of an air bag joins the air bag door epidermis 50, said thrust concentrates in V typeface slot 36, makes V typeface slot 36 fracture promptly, and is made to perform opening of an air bag door certainly and promptly.

In addition, the shape of a quirk of said V typeface slot 36 is not limited to the configuration where the groove bottom section as shown in drawing sharpened acutely, and is good by the configuration of an air bag door, the quality of the material of epidermis, etc. also considering an obtuse angle configuration or a groove bottom side as the shape of a curved surface.

Next, the example of the manufacture approach of the air bag door epidermis of the 1st invention is explained. Fig. 2 is a partial expanded sectional view at the time of sheet-like epidermis material rear-face press according [Fig. 4] to a heating cutting edge according [the side elevation of the equipment in which an example of the manufacture approach of the 1st invention is shown, and Fig. 3] to the A-A sectional view.

First, as shown in Figs. 2 and 3, the thermoplastic sheet-like epidermis material 20 which consists of vinyl chloride resin fabricated in the predetermined configuration by the vacuum forming or powder slush molding is laid in susceptor 22 front face, as a rear face turns up.

The projection 26 to which susceptor 22 regulates the amount of press of the heating cutting edge 24 which carries out a postscript to the front face in which it becomes from the becoming magnitude and the sheet-like epidermis material 20 is laid size from the sheet-like epidermis material 20 (the amount of penetration of the heating cutting edge 24 into the sheet-like epidermis material 20) is formed in the outside location of the epidermis material 20.

Next, the heating cutting edge 24 is dropped with the body 28 of a heater, and the division schedule section of sheet-like epidermis material 20 rear faces is pressed with the heating cutting edge 24.

The part of the cutting edge at a tip consists of a cross-section V typeface, and said heating cutting edge 24 is attached downward in body of heater 28 inferior surface of tongue located in the susceptor 22 upper part with the installation screw 30, and is heated by predetermined temperature with the body 28 of a heater. Whenever

[stoving temperature / of the heating cutting edge 24] is made into temperature usually almost equal to the melting temperature of the thermoplastics which constitutes the sheet-like epidermis material 20 although it changes with the quality of the material of the sheet-like epidermis material 20, or press time amount of the heating cutting edge 24. For example, the sheet-like epidermis material 20 is a thing with a thickness of 1.0–1.2mm formed of powder slush molding made of vinyl chloride resin, and when the press time amount of a heating cutting edge is 5 – 15 seconds, about 180–250 degrees C is suitable. Moreover, as for the amount of press of the sheet-like epidermis material 20 with the heating cutting edge 24, it is desirable to make it the heating cutting edge 24 at the time of the press and the distance between sheet-like epidermis material 20 front faces (susceptor 22 front face) set to 0.4–0.9mm. In addition, accommodation of the amount of press is made by selecting the height of the cylindrical projection 32 of body of heater 28 inferior surface of tongue which carries out a postscript, and the projection 26 of said susceptor 22 front face to a predetermined value. Moreover, what is necessary is just to round off a part for the point of said heating cutting edge 24, when making the base of V typeface slot into the shape of a curved surface, as described above.

On the other hand, the body 28 of a heater moves the heating cutting edge 24 up and down, and enables press of sheet-like epidermis material 20 rear faces with the heating cutting edge 24 while it heats the heating cutting edge 24 attached in this body 28 of a heater to predetermined temperature. While heating wire, such as a nichrome wire for heating the heating cutting edge 24 on the body 28 of a heater, is wired, in order to make regularity the amount of press of sheet-like epidermis material 20 rear faces with the heating cutting edge 24, the cylindrical projection 32 which hits with the projection 26 of said susceptor 22 front face at the time of body of heater 28 descent, and stops the body 28 of a heater in a predetermined location is formed in the inferior surface of tongue. In addition, vertical movement of the body 28 of a heater is made by the vertical-movement means 34, such as a pneumatic cylinder.

The division schedule section of sheet-like epidermis material 20 rear faces pressed with the heating cutting edge 24 deforms into the configuration of the heating cutting edge 24 as shown in Fig. 4, and V typeface slot 36 for division is formed. In that case, the plastics fused with the heating cutting edge 24 is made a slot side edge by the edges on both sides of V typeface slot 36 with the heating cutting edge 24 concerned, and rises to them, and the heavy-gage part 38 which became bank-like is formed in them along V typeface slot 36.

And if the press with this heating cutting edge 24 raises the heating cutting edge 24 with the body 28 of a heater after usually carrying out for 5 to 15 seconds, predetermined time and, the press with the heating cutting edge 24 is canceled and mold goods are removed from susceptor 22, the desired air bag door epidermis 50 shown in Fig. 1 will be obtained.

Next, the example of the manufacture approach of the 2nd invention is explained. The sectional view at the time of laying the side elevation of the equipment which uses Fig. 5 in the case of manufacture of the air bag door epidermis in the example, and Fig. 6 in the B-B line sectional view, and Fig. 7 laying sheet-like epidermis material in a susceptor front face, and drawing in, and Fig. 8 are partial expanded sectional views showing the time of the press on the rear face of sheet-like epidermis material with a heating cutting edge. In addition, the same sign as Figs. 2 thru/or 4 shows the same member about the sign in drawing.

First, the susceptor 40 of equipment and heating cutting-edge 24 grade are explained. The interior consists of hollow and susceptor 40 has the tubed suction opening 48 which connects two or more vacuum suction holes 46 which open the centrum 42 and a flat top front face for free passage, and the vacuum pump (not shown) of a centrum 42 and the exterior in the front face or the flank, as shown in Fig. 6. The projection 26 which regulates the amount of press of the heating cutting edge 24 is formed in the front face of this susceptor 40.

In addition, about the cylindrical projection 32 which regulates the amount of press of sheet-like epidermis material 20 rear faces with the screw 30 which attaches the heating cutting edge 24 and said heating cutting edge 24 in the body 28 of a heater, the body 28 of a heater which heats said heating cutting edge 24 to predetermined temperature, and the heating cutting edge 24, it is the same as that of the example of the 1st invention.

And it is made for the rear face to become upward, and as shown in Fig. 7, the sheet-like epidermis material 20 beforehand fabricated in the predetermined configuration by powder slush molding etc. is laid in susceptor 40 front face, as the division schedule section becomes just under the heating cutting edge 24, and vacuum suction of the sheet-like epidermis material 20 is carried out on susceptor 40 front face through the vacuum suction hole 46 of susceptor 40 front face. While the sheet-like epidermis material 20 of a predetermined configuration is adsorbed and held on susceptor 40 front face by this, it is made a plane by it according to the shape of surface type of susceptor 40.

Then, the cylindrical projection 32 drops said body 28 of a heater in the projection 26 of susceptor 40 front face by actuation of the vertical-movement means 34. As shown in Fig. 8, the specified quantity press of the division schedule section of sheet-like epidermis material 20 rear faces is carried out by this with the heating cutting

edge 24 of body of heater 28 inferior surface of tongue, and of it, the cross-section V typeface slot 36 is formed in the division schedule section of epidermis material 20 rear faces. Since vacuum suction of the sheet-like epidermis material 20 is carried out on susceptor 40 front face in that case, the front face of the sheet-like epidermis material 20 and the front face of susceptor 40 are stuck without a clearance, the front face of this sheet-like epidermis material 20 and the distance a between the heating cutting edges 24 become always fixed, and V typeface slot 36 for division of the fixed depth is formed. In addition, a sign 38 is the heavy-gage part formed in V typeface slot 36 edges on both sides of sheet-like epidermis material 20 rear faces of press of the heating cutting edge 24.

Then, if vacuum suction of the sheet-like epidermis material 20 is also canceled and mold goods are removed from susceptor 40 front face by actuation of the vertical-movement means 34 while raising the body 28 of a heater and canceling the press on the rear face of sheet-like epidermis material with the heating cutting edge 24, the desired air bag door epidermis 50 as shown in Fig. 1 will be obtained. In addition, the sheet-like epidermis material by which vacuum suction was carried out on susceptor 40 front face returns to the configuration before vacuum suction by discharge of vacuum suction.

Fig. 9 is a perspective view showing an example of the instrument panel with which, as for the sectional view of an example of air bag equipment, and Fig. 10, the partial expanded sectional view was attached, and, as for Fig. 11, the air bag equipment was attached using said air bag door epidermis 50. Like illustration, the air bag door 52 consists of three layers of synthetic-resin foam 56, such as a core material 54 and urethane foam, and said air bag door epidermis 50. A core material 54 consists of two rigid plastic products which carried out the door configuration of a double door, and the outside edge is attached in the instrument panel 58 of a passenger side. Air bag equipment 60 consists of the air bag 62, an air bag stowage 64, an inflator 66, and an air bag door 52 of said 3 layer structures. At the time of an automobile collision, an air bag 62 expands by actuation of an inflator 66, V typeface slot 36 for division of air bag door epidermis 50 rear face fractures the air bag door 52 by push and its thrust from the inside, this air bag door 52 opens the air bag equipment 60 outside, by it, an air bag 62 develops between crew and a windshield, and it takes care of crew. Moreover, since the reinforcement of the both sides of the V typeface slot 36 for division is high by the heavy-gage part 38 which the air bag door epidermis 50 has in the both sides of V typeface slot 36 for division in that case and which rose, it is easy to concentrate the thrust by expansion of an air bag on V typeface slot 36 for division, and cancellation can be certainly carried out in a short time compared with the case where the V typeface slot 36 is formed with the conventional knife etc. And since said V typeface slot 36 is formed in the rear-face side of the air bag door epidermis 50 which does not touch always at crew's eyes, it serves as neither hindrance on the design of an instrument panel, nor a limit.

(Effectiveness)

Since according to the manufacture approach of the air bag door epidermis for automobiles the 1st invention a heavy-gage part is formed along with the edges on both sides of the V typeface slot while pressing the rear face of sheet-like epidermis material with a heating cutting edge and forming V typeface slot for division in post processing after sheet-like epidermis material shaping, the V typeface slot cannot carry out meandering etc., and generating of a defective can be lessened. And since the air bag door epidermis obtained by implementation of the 1st invention is formed in the background of the air bag door epidermis with which V typeface slot for division does not touch crew's eyes, the design of the vehicle interior of a room is not restricted. it -- in addition, since a heavy-gage part is formed in the edges on both sides of V typeface slot and the reinforcement of the edges on both sides of V typeface slot is raised to them, V typeface Mizouchi's reinforcement will be in the condition of having fallen extremely as compared with the perimeter, and it will be easy to concentrate the thrust at the time of air bag expansion on V typeface Mizouchi. Therefore, it fractures certainly by said V typeface Mizouchi, and prompt and positive disconnection of an air bag door is enabled.

According to the manufacture approach of the air bag door epidermis for automobiles the 2nd invention, to said 1st effect of the invention Furthermore, in order [in addition,] to press a sheet-like epidermis material rear face with said heating cutting edge, carrying out vacuum suction of the sheet-like epidermis material on a susceptor front face, Distance between a heating cutting edge and a sheet-like epidermis material front face can be fixed at the time of the press, V typeface slot formed of the press can always be made into a fixed configuration, and the pressure as a design can make V typeface slot fracture. In addition, by carrying out vacuum suction of the sheet-like epidermis material, epidermis material can be correctly held on a susceptor front face at the time of press of a heating cutting edge, and the location of V typeface slot can be made exact.

[Translation done.]

* NOTICES *

JPO and NCIPi are not responsible for any damages caused by the use of this translation.

- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.**** shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

The sectional view of an example of the air bag door epidermis with which Fig. 1 was obtained by implementation of the 1st invention, The side elevation of the equipment which Fig. 2 shows an example of the manufacture approach of the 1st invention, and Fig. 3 The A-A sectional view, The partial expanded sectional view showing [4] the time of the sheet-like epidermis material rear-face press with a heating cutting edge in this example, Fig. 5 the side elevation of the equipment in the example of the 2nd invention, and Fig. 6 The B-B line sectional view, The sectional view showing the time of Fig. 7 laying sheet-like epidermis material in a susceptor front face, and attracting it in this example, The partial expanded sectional view showing [8] the time of the press on the rear face of sheet-like epidermis material with a heating cutting edge in this example, The sectional view showing an example of the air bag equipment using the air bag door epidermis 50 with which Fig. 9 was manufactured by the manufacture approach of this invention, The perspective view showing an example of the instrument panel with which, as for Fig. 10, the partial expanded sectional view was attached, and, as for Fig. 11, the air bag equipment was attached, and Fig. 12 are sectional views of an air bag door using the air bag door epidermis manufactured by the conventional approach.

20 [.. A heavy-gage part, 40 / .. Susceptor, 44 / .. A susceptor front face, 46 / .. Vacuum suction hole]
Sheet-like epidermis material, 24 .. A heating cutting edge, 36 .. V typeface slot, 38

[Translation done.]

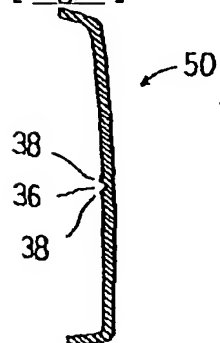
* NOTICES *

JPO and NCIPi are not responsible for any damages caused by the use of this translation.

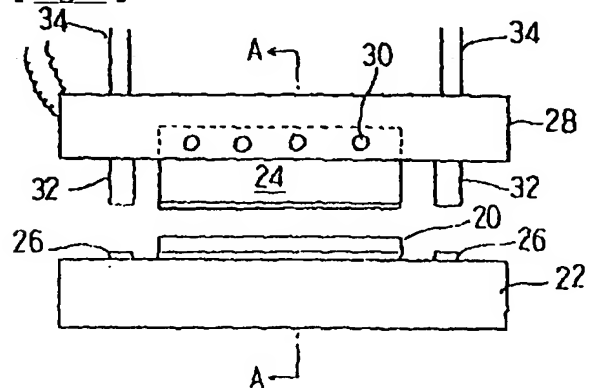
- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.*** shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

DRAWINGS

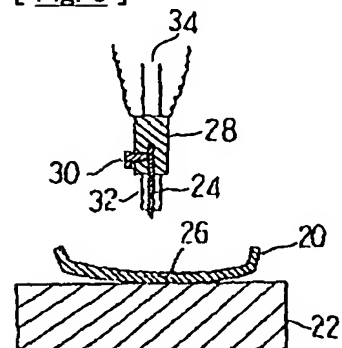
[Fig. 1]



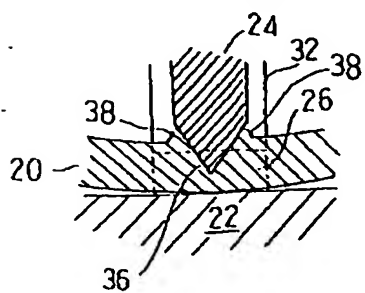
[Fig. 2]



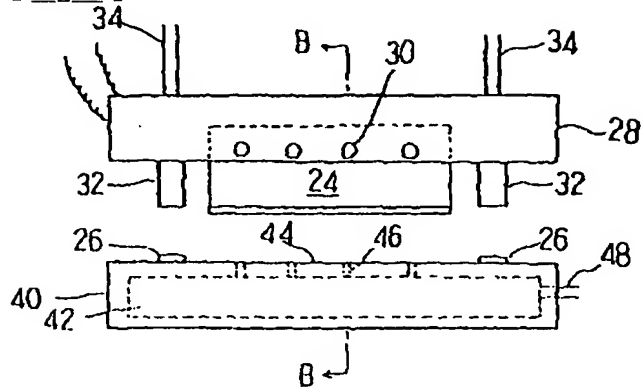
[Fig. 3]



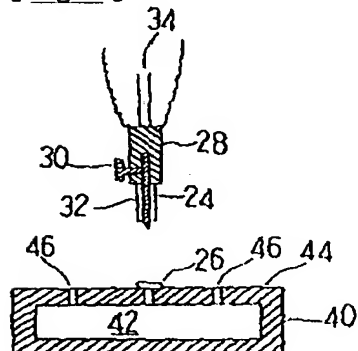
[Fig. 4]



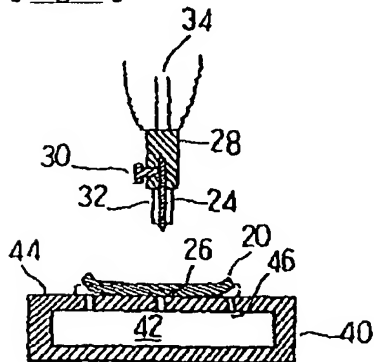
[Fig. 5]



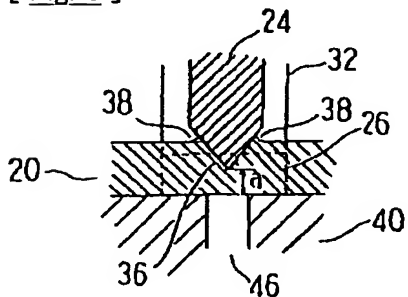
[Fig. 6]



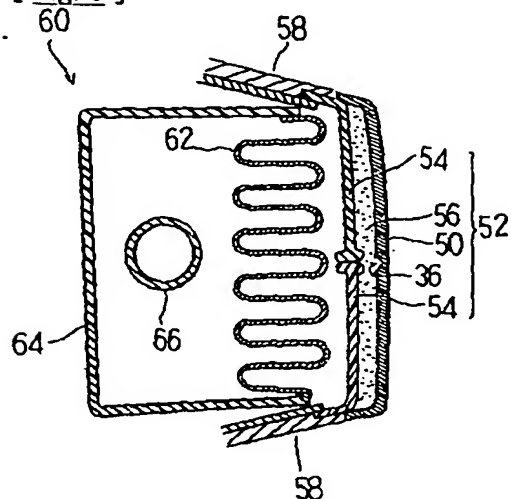
[Fig. 7]



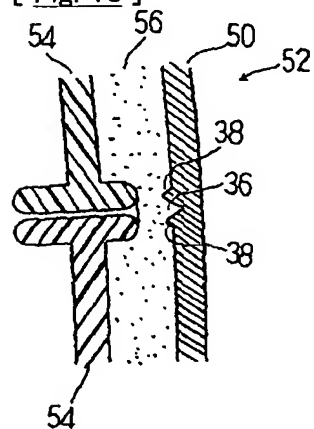
[Fig. 8]



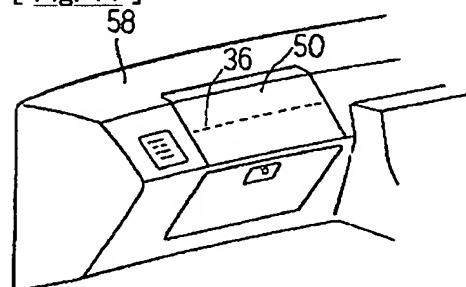
[Fig. 9]



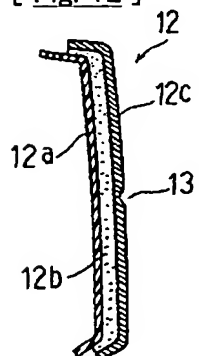
[Fig. 10]



[Fig. 11]



[Fig. 12]



[Translation done.]

**This Page is Inserted by IFW Indexing and Scanning
Operations and is not part of the Official Record.**

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:

- ☐ BLACK BORDERS
- ☐ IMAGE CUT OFF AT TOP, BOTTOM OR SIDES
- ☐ FADED TEXT OR DRAWING
- ☐ BLURRED OR ILLEGIBLE TEXT OR DRAWING
- ☐ SKEWED/SLANTED IMAGES
- ☐ COLOR OR BLACK AND WHITE PHOTOGRAPHS
- ☐ GRAY SCALE DOCUMENTS
- ☐ LINES OR MARKS ON ORIGINAL DOCUMENT
- ☐ REFERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY
- ☐ OTHER: _____

IMAGES ARE BEST AVAILABLE COPY.

As rescanning these documents will not correct the image problems checked, please do not report these problems to the IFW Image Problem Mailbox.